REMARKS

The Examiner stated that the submission of July 13, 2006 has been entered. The claims are now amended further by incorporating claim 3 into claim 1 and canceling claim 1.

§ 112. The claims were rejected under §112, first paragraph, for claim 1 reciting "sufficient to break an Si-N bond" while not reciting the Si-N bond to be broken. This rejection is believed to be overcome by the present amendment, which imports the subject matter of claim 3 (including an Si-N bond) into claim 1. Withdrawal of the rejection is requested.

§ 103. The claims were rejected under §103 over Usuki '151, newly cited. This rejection is respectfully traversed. The Examiner is invited to consider the following arguments:

Vacuum CVD. The Applicant claims a "vacuum ultraviolet radiation CVD (Chemical Vapor Deposition) system," but Usuki discloses no vacuum and no vapor deposition. Usuki says its process is carried out "in air" (col. 6, line 57), whih implies atmospheric pressure. The Examiner has not cited the reference for any teaching of vacuum, or even asserted that such teaching is found in the reference.

Neither is there any mention of vapor *deposition* because Usuki starts and ends with a film; the film is not formed by vapor deposition. This is discussed below.

Film/Gas. Usuki's method results in a protective "film" but Usuki repeatedly refers to the precursor silazane, also, as a "film." The precursor film is mentioned three times in the Abstract and three times in claim 1, and also at col. 4, lines 13, 15, 37, 61, and 64; col. 6, lines 59 and 65; and etc. The precursor film is mentioned in the text applied in the rejection, at col. 8, lines 44 and 47.

Silazane is a hydrated chain of Si and N atoms joined by covalent bonds (Wikipedia) and can be either organic (with carbon) or inorganic (without carbon). The Applicant claims "organosilazane gas," that is, a gas with organic silazane. Usuki discloses only *in*organic silazane, and does not disclose gas.

Usuki uses *poly*silazane, which is defined at col. 6, line 34. (The Examiner is invited to note the absence of carbon in the formula at col. 6, line 45, showing that it is inorganic.) This polysilazane appears to have two chains of Si and N atoms joined in parallel.

The Applicant notes that the polysilazane used by Usuki, with its double chain, probably has a molecular weight high enough that it remains liquid or solid at processing temperatures, which is the probable reason why it is a film and not a gas.

Organic/Inorganic. Usuki states that its method "relates to an *in*organic protective film" (col. 1, line 15; emphasis added) and this is reiterated in the Abstract and throughout the Detailed Description. The inorganic protective film is repeatedly stated to be silica (e.g., col. 1, line 6; col. 6, line 56), that is, SiO_2, a compound lacking carbon.

Thus, Usuki discloses and teaches starting with a film of *in*organic silazane and ending with an *in*organic coating. No carbon and no organic compounds are seen in either the starting or the ending products. With respect, the reference does not disclose the Applicants claimed organosilazane gas.

Oxidation. Usuki forms the silica from the precursor film of polysilazane by oxidizing it (col. 2, lines 63-67; col. 7 lines 3-8) and/or by irradiating it. However, the irradiation is seen to be an adjunct method (for producing ozone) rather than a method that stands on its own.

Usuki mentions radiation as an adjunct to ozone at col. 8, lines 42-48, stating that, with radiation, "decomposition of ozone can be promoted, and the oxidation reaction can be accelerated" (col. 8, lines 53-55); in other words, the radiation makes more ozone and that is what oxidizes the polysilazane into silica. Ozone (O_3) breaks into atmospheric oxygen (O_2) and monatomic oxygen (O) under the influence of radiation at any wavelength less than 320 nm (Wikipedia article on "photodissociation").

In the next paragraph at col. 8, lines 56-65, Usuki discloses the use of radiation *without* ozone, but here discloses wavelengths of 185 or 254 nm by which "ozone can be generated by the light" (line 62). Radiation is a well-known way of creating ozone, and atmospheric oxygen is dissociated to form ozone when exposed to light less than 240 nm (Britannica 15th Ed., vol. 2, page 308).

Wavelength. In the applied text at col. 12, lines 15-34, Usuki says (line 18) that "it is possible to employ infrared rays, ultra-violet rays, various kinds of laser beams, cathode rays [i.e., electrons], or the like." The Applicant sees this passage as boilerplate, because it is unrelated to the rest of the disclose and also because the use of infrared rays is directly contrary to the stated aim of Usuki's "second method" (col. 11, lines 54-57) of keeping the temperature low (col. 11, line 66 and col. 12, lines 1-2).

Usuki teaches at col. 12, lines 25-34, that "oxidation and polymerization" (*no*t breaking of Si-N bonds) is the process and that, if ultraviolet is used, it should be of wavelength shorter than 200 nm, such as mercury vapor light at 185 nm. This ultra-violet wavelength is short enough to both create ozone (<320 nm) and to dissociate the ozone (<240 nm). Here, again, Usuki describes radiation to produce ozone and oxidation, and, in the paragraph directly following (col. 12, lines 35-39) explicitly mentions ozone to "promote oxidation of the polysilazane. The Applicant respectfully sees that this applied passage of the reference teaches augmenting oxidation by use of radiation, and nothing else.

Breaking Bonds. The person of ordinary skill in the art, when considering the prior art as a whole, would conclude that Usuki's real teaching is that wavelengths as long as 240 nm can be used, but shorter wavelengths are also usable. Seeing Usuki mention both a low-pressure mercury-vapor lamp and an excimer laser (col. 12, lines 28-34) as examples of suitable source, and knowing that a mercury vapor lamp is much cheaper than an excimer laser, the person of ordinary skill would have used a mercury-vapor lamp. (An ordinary fluorescent bulb is a mercury-vapor lamp). Since Usuki teaches oxidation rather than breaking Si-N bonds, there is no reason why the person of ordinary skill in the art would have splurged on an excimer laser, and no reason for the person of ordinary skill to have used light of 172 nm, as claimed.

Energy. The Examiner asserts that the Applicant's claimed energy is obvious as an optimized value of a variable that would have been reached through routine experimentation. The Applicant respectfully differs, because the prior art does not suggest experimentation. The person of ordinary skill does not do anything that is not suggested by the prior art, and therefore does not perform any experimentation, unless there is some suggestion to do so. With respect, the Examiner has pointed out no such

suggestion in the reference nor has the Examiner provided a reasoned argument as to why the person of ordinary skill would have experimented.

Dependent Claims. With respect, the Examiner has not specifically addressed the limitations of the dependent claims. For example, the Examiner does not point out where the claimed additive gas for increasing nitrogen content, or a regulator gas for regulating partial pressure, are disclosed in the reference.

For the reasons above, and in view of the amendment, withdrawal of the rejections and allowance of the claims is respectfully requested.

Respectfully submitted,

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